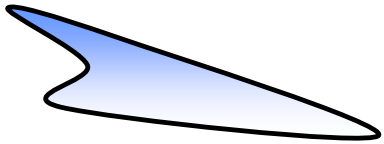
LEVEL WATERS

AUTOMATIC WATER LEVELING SYSTEMS



LCS-3401

Automatic Water Leveling System

User Manual

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Table of Contents

Table of Contents i
Safety Overview 1
Installation 2
Preparing for Installation 2
Installing the Controller 3
Installing the Pro-Mount 4
Installing the Sensor 4
Installing the Fill Valve Unit 5
Plumbing the Unit 6
Installing Interconnection Cables 7
Operation 8
    Adjusting Water Level 8
Fill Cycle 9
Alarm Condition 10
Maintenance 10
Troubleshooting 11
Overcycling 12
    Overview 12
    Strategy 12
Manufacturer's Statement 13
Blank Page 14
Notes 15/16
Warranty 17

Safety Overview

The LCS-3401 Pond Filling System is designed to provide the user a safe product that is easy to install and use. When installed as described in this manual, the system presents no unsafe shock hazards. However, altering any of the components may present an unsafe circumstance.

Some other considerations to keep in mind during installation and operations are as follows:

Never mount the LC-901 controller in an outdoors environment where it will get wet. The controller and power supply are **for indoor use only.**

Do not insert metal objects into sensor probes while unit is turned on.

Do not break seals on controller. Doing so may expose the user to potentially dangerous voltages when unit is turned on and will void the warranty.

Always mount the controller out of the reach of small children.

Always use safety equipment, such as eye protection, and dust mask when cutting PVC piping along with other normal safety precautions.

Always carefully follow all installation instructions.

Installation

The LCS-3401 Automatic Pond Filling System is simple to install, requiring simple PVC pipe installation and screw mounting the control, fill valve and sensor. All electrical connections are done through waterproof circular connectors for outdoor components and a single DB9 connector to the controller. The limited plumbing that is necessary to provide the system with filling water, requires only a hacksaw (or other appropriate saw), PVC cement and sufficient PVC and adapters.

Preparing for Installation

Open the package and ensure that all of the components are present and have not been damaged in shipping. Items included in the system are:

- LC-901 Controller
- FV-1034 Fill Valve Module
- MNT-P Pro-Mount
- WC-001 15’ Control Cable
- WC-002 25’ Sensor Cable
- 24VAC Power Supply
- WLS-901 Sensor Unit
- Mounting Accessory package w/Hose-MPT adapter

Identify where the FV-1034 fill valve module and the controller will be mounted. The FV-1034 should be mounted near an outside spigot and within 24 feet of the pond to allow connection to the sensor with the 25’ WC-002 Sensor Cable.

The LC-901 Controller needs to be located in a dry location within 14 feet of the FV-1034 to allow for connection between the two units with the 15’ WC-001 Control Cable.

Note: Cables WC-001 and WC-002 should be laid out to determine proper spacing for the system components when considering where the cable will run. The WC-002 cable may follow the PVC run to the pond for ease of installation.

Installing the Controller

Make sure that the power switch is in the OFF (0) position. Open the battery compartment on the backside of the controller. Install the battery provided. Replace battery cover. Mount controller on wall in a dry location using the two #6 screws and template provided (Level Waters recommends that the controller be mounted indoors, although a well-protected patio will work).

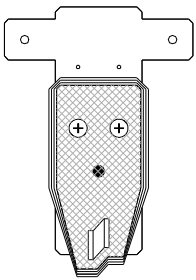
Installing the Pro-Mount

Determine a location where the sensor will be mounted (try to find an inconspicuous place.). If the sensor is to be mounted in a skimmer, locate the surface it will mount on and verify that the sensor window will maintain the level at the optimum height for the skimmer.

Mark the mounting surface to match the two mounting holes in the Pro-Mount. Drill a small #4 pilot hole at the marks and screw the Pro-Mount to the mounting surface with the #6 stainless screws provided.

Installing the Sensor

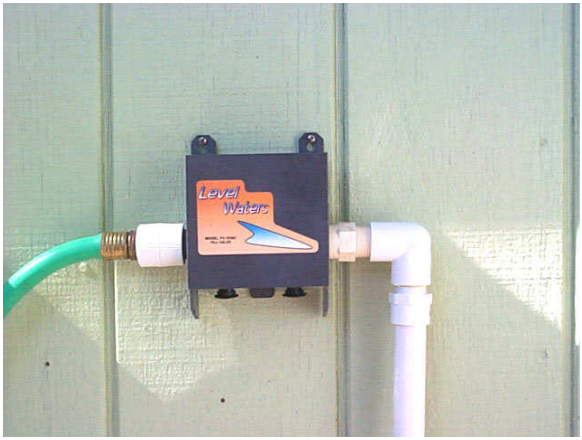
Position the sensor so that the probe window faces down toward the water with the dimple of the sensor at the desired level of the pond waterline. The bottom of the sensor probes should fall approximately 1-½ - 2 inches



below the pond edge. The sensor height will need to be adjusted (covered later in this manual) to take into account ancillary water systems such as fountains and waterfalls. Screw the two captive screws into the face of the Pro-Mount alternating between the two every third turn for a snug seat. **DO NOT over-tighten the screws!**

Installing the Fill Valve Unit

Using two #6 stainless-steel screws provided, mount the FV-1034 Fill Valve unit to a suitable structure within 24 feet of the pond by way of the screw slots in the upper tabs. Leave the screws slightly loose to allow for installation of drip loops in the cables once connected.



Plumbing the Unit

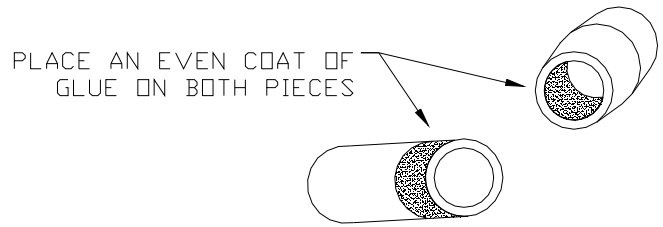
Using ¾" PVC pipe (available at most hardware stores) run water supply from the fill valve outlet to the pond routing it the way desired.

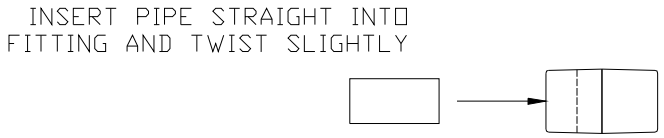
Parts needed:

- Hacksaw (or other suitable fine-toothed saw)
- PVC glue
- Required lengths of 3/4" PVC
- Required angle adapters.

Cut and fit all PVC pipe from the FV-1034 Fill Valve to the pond without gluing to make sure that the pipes are where the user desires them.

Clean and glue all parts with general PVC cement to form a watertight seal. Allow joints to dry for 24 hours before connecting water to the system.





Connect the water spigot to the input of the FV-1034 valve module using a short length of garden hose (a hose reel leader works well) and a chlorine filter (available through level Waters) if needed. The input may be plumbed to ¾" FPT if desired rather than using the adapter.

Installing the Interconnection Cables

Connect the sensor interface cable WC-002 to the sensor connector. Wrap connector with vulcanizing tape. Run the sensor interface cable WC-002 as desired back to the FV-1034 module and connect to the 4-prong jack. Lightly lift bottom of the valve module and run the sensor cable through the capture loop on the side farthest from the connector making sure to leave a small drip loop. Secure cable with a gray tie-wrap (provided) using the two holes on the cable guide tab.

Connect the control cable WC-001 to the 6-prong jack on the FV-1034 valve unit in the same manner as the sensor cable above. Install third #6 screw in the bottom tab and tighten all valve mounting screws.

Run the control cable to the LC-901 controller as desired. Connect the 9-pin connecter to the control jack J2. Secure captive screws snugly. Do not over-tighten! There may be a small gap between the screw tab and jackscrew.

Make sure that power is off on the LC-901 Controller. Plug the power connecter into the power adapter jack in the bottom of the controller. Plug the power adapter into a wall socket.

Operation

Turn the power switch to the on position. The green power lamp should light. The red light may flash and the Amber fill lamp should light and stay lit for approximately twenty seconds. (If the amber fill light does not light, the sensor may be below the waterline.)

Note! Depending on the level of the water at the time of power up, the unit may goes through several fill cycles before turning off.

Adjusting Water Level

Since each pond's water dynamic characteristics are different, the level of the pond will vary with changes in pump cycles for fountains and waterfalls since these units draw water in and lift it out of the pond.

If there are no pumps that lift water out of the pond (lifting pumps) and cycle on and off over time, or if the pumps remain on constantly, the pond's waterline will remain somewhat constant over time. Adjusting the WLS-901 sensor to the desired level should work well. The level will fluctuate slightly between the beginning and end of the fill cycle.

If there are lifting pumps, however, that cycle on a schedule, the water level will drop when the pumps are on and rise when they are off (Pumps

that merely circulate water will have no effect). This will cause the waterline to fluctuate between what we term as the quiescent (no pumps on) and dynamic (any lifting pump on) level. The quiescent level will be lower than immediately after a dynamic cycle where the pumps have just turned off.

Sensor level adjustment must account for this and the installer will need to adjust for optimal level over a period of a few days. To do so, follow these steps:

1. Adjust the WLS-901sensor so that the bottom edge of the probe window is between 2 and 2 ½ "from the top edge of the pond with no lifting pumps on.
2. Observe the level of the water just after a dynamic cycle (a lifting pump has cycled on and turned off). This is the dynamic level.
3. Make a mark on the sensor and adjust the sensor to align the mark to approximately 1" below the top edge of the pond.
4. Observe the waterline in both quiescent and immediately after a dynamic cycle. Make minor adjustments to reach optimal water level. Take care not to raise the sensor too high. This will cause a possible overflow condition and will waste water. Generally, 1" from the top after a dynamic cycle and approximately 2" from the top of the pond for the quiescent level is sufficient.

Even though a pond with lifting pumps will have a dynamic range and a quiescent range, the quiescent range may never be observed depending on the frequency of the lifting pump cycles.

Fill Cycle

When the water level goes below the preset level (dynamic or quiescent), the LC-901 controller will begin a 20 second timed fill. The amber 'FILL' lamp will light and remain on during the fill cycle and will go out when the fill cycle ends. Depending on the size of the pond, the supply water pressure and how much water is needed, multiple fill cycles may occur.

Alarm Condition

The LC-901 controller provides an alarm notification in the event of loss of sensor connectivity or loss of power. During either of these conditions, the Red lamp will light and the piezo alarm will sound for the following conditions:

- Red Green – Sensor Loss alarm
- Red Green – Power Loss alarm

The piezo alarm will only sound for a period of time until the battery is exhausted. To silence the alarm and extend battery life, turn the LC-901 Controller power off until problem is resolved (see troubleshooting).

Maintenance

The LCS-3401 requires little regular maintenance. The following steps should be taken to ensure optimum operation of the system:

Battery - The battery should be changed every six months or after a prolonged period of alarm condition with a 9v alkaline battery.

Sensor – Periodically clean debris from probe window to maintain optimum operation.

Over time, the sensor probes will wear due to electrolytic reactions. This is normal and will not affect the operation of the unit. A probe that is ¾ of its original length or moderately pitted should be replaced. Replacements may be found at www.aquilitysystems.com or from your favorite dealer.

Note! Most municipal areas add chemicals such as chlorine to the city water supply, which may harm or kill any fish living in the pond if not treated properly. Ensure that your water is suitable for fish before using the LCS-3401 or that an appropriate filter is used. The CLF-4S may be used for all systems to filter out chlorine for up to 1 year.

Troubleshooting

The LCS-3401 Automatic Pond Leveling system should maintain the level in your pond for many worry-free years. However, if you should experience problems with it, it may be caused by some of these common issues that can be resolved by the user:

- ✘ Pond overflows when filling
  - ✓ Readjust sensor height to lower water level
- ✘ Pond will not fill
  - ✓ Check to make sure power is on and green lamp on controller is lit.
  - ✓ Check for debris on sensor and clean per instructions
  - ✓ Check to ensure sensor connector has weatherproof tape installed. Allow connector to dry if necessary and install tape.
- ✘ Sensor alarm is sounding but sensor looks ok
  - ✓ Check sensor cable and connections.
  - ✓ Check control cable and connections.
- ✘ Power Loss/Over-cycling alarm is sounding
  - ✓ Check that power plug is in and plugged into the wall.
  - ✓ Check to verify that the pond does not have a large leak (see over-cycling).

Over-cycling

Overview

The frequency that the pond fills is an indication of how much water is being lost over time. Frequent cycling could be the indication of a leak that could become worse as time progresses. The owner should be aware of the pond cycling time so that, should the pond develop a leak, they can take corrective action before it becomes too severe for the LCS-3401 to compensate for.

Once a leak becomes larger than the flow into the pond from the LCS-3401, the system will cycle repeatedly and finally trip the resetable fuse. The problem should be corrected prior to reaching this stage. Generally, if the pond is cycling more than a couple of times per day, there is a leak somewhere unless there is a water replenish system in use. The LCS-3401 will handle cycling as frequently as one every ten minutes. After this, depending on the ambient temperature that the controller is in, the unit will go into over-cycling alarm and will power down.

To reset the system, the unit must be switched off, the problem repaired and the pond refilled. This should give the unit time to reset before it is turned on again.

Strategy

The general belief in many circles is that a pond filling system should be turned off when a leak is detected thereby saving valuable water. However, many pond owners that keep fish might disagree. As expensive as fish are, using some water to save them is economical. Therefore, the LCS-3401 will attempt to maintain level even though there is a leak and the owner will need to remain aware of how often the pond is filling.

Manufacturer's Statement

Thank you for purchasing the Level Waters LCS-3401 Pond Filling System. The system has taken many years of engineering and development and it is our wish that it will provide you, the customer, with years of trouble-free service.

As pond enthusiasts ourselves, we have found that while electronic sensing is more expensive than float-valves, it is far more dependable and less intrusive to the beauty of any pond because of the lower profile of the sensing unit. Other systems have tried a similar approach, although none have been successful in maintaining a proper level in turbulent water, as the LCS-3401 is capable of doing.

As well, other systems do not provide a modularized system for ease of installation. We think that you will find this feature to be superior to other supplier's systems that cost considerably more. The average pond keeper will be able to install the system with ease and will never have to worry about floats getting clogged or filling with water again.

The LCS-3401 is made for small to medium ponds and is hand assembled from PVC material instead of molded ABS plastic. PVC provides for better endurance in sunlight and heat and will extend the life of the components over time than using other plastics would.

Using a single plane geometric sensor design along with delayed fill allows the Level Waters' filling technology to achieve an optimum level even though the water is turbulent and can be adapted for larger applications on a special order basis.

For more information on the LCS-3401 or custom orders visit us on the web at www.aquilitysystems.com.

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Notes

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Warranty

Aquility Systems, Inc warrants this product to the original purchaser for a period of one year against defects in material or workmanship when used for normal residential purposes it is intended for. In order to obtain a replacement unit or repair the existing unit, you must return the complete unit, postage prepaid, to the place of purchase, or to the Aquility Systems facility.

(6949 SW 21st Lane, Gainesville, FL 32607)

This warranty is intended to cover product defects only. Aquility Systems, Inc. is not liable for indirect, incidental or consequential damages in connection with the use of the Level Waters product covered by this warranty. This warranty does not cover any cost or expense incurred by the purchaser in providing substitute equipment or service during reasonable periods of malfunction or non-use of this product, while waiting for completion of repairs under this warranty. Some states do not allow exclusions of incidental or consequential damages, so the above exclusions may not apply in all states. This warranty gives you specific legal rights in your state, which vary from state to state.

If you wish to contact Aquility Systems, Inc., please direct inquiries to:

Customer Service
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